

PATENT ABSTRACTS OF JAPAN

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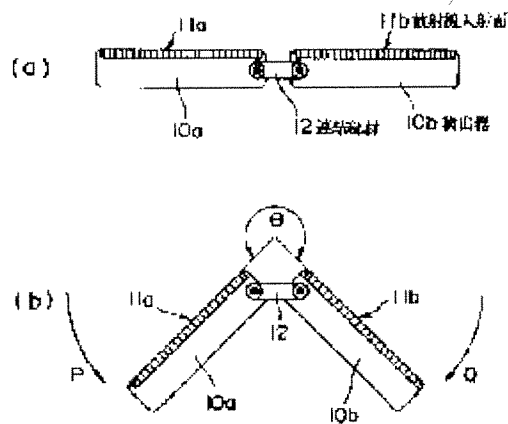
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(54) GAMMA CAMERA

(57)Abstract:

PROBLEM TO BE SOLVED: To improve the picture quality of a radiation image being obtained by avoiding the incidence of radiation from the background part of the target organ of a specimen and reducing the intake of noise in a gamma camera.

SOLUTION: A gamma camera is provided with a detector for applying radiation being discharged from a target organ due to given radiopharmaceuticals for detection and generates a radiation image from the position information on the above incidence radiation by processing the detection signal. In the gamma camera, a plurality of detectors 10a and 10b that are thin are directed in the same direction and adjacent side end parts are connected, and at the same time an angle θ between radiation incidence surfaces can be set to an arbitrary angle to avoid the incidence of radiation from the background part of the target organ of a specimen, thus reducing the intake of noise while avoiding the incidence of radiation from the background part of the target organ



and improving the picture quality of the obtained radiation image.

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] In gamma camera which generates a radiological image from position information on radiation which it has a detector which enters and detects radiation emitted from an object organ by a radioactive medicine prescribed for the patient into analyte, processed a detecting signal from this detector, and entered [above-mentioned], Gamma camera having connected a side edge part where thickness turns a radiation incidence side to a uniform direction, and adjoins mutually two or more detectors formed small, and enabling setting out of a mutual radiation incidence face-to-face angle to a free angle which avoids incidence of radiation from background parts of an object organ of analyte.

[Claim 2] Connect a side edge part where two detectors adjoin mutually by a connecting member, and. The gamma camera according to claim 1 connecting both detectors by an angle setting mechanism so that setting out to a free angle is possible, and holding the above-mentioned angle setting mechanism by a support member, and arranging a radiation incidence side of two above-mentioned detectors to abbreviated reverse V type.

[Claim 3] Connect a side edge part where two detectors adjoin mutually by a connecting member, and. The gamma camera according to claim 1 having 2 sets of detector groups which connected both detectors by an angle setting mechanism so that setting out to a free angle was possible, holding those angle setting mechanisms by a support member, and arranging a radiation incidence side of the 2 above-mentioned sets of detector groups to approximately W type.

[Claim 4] The gamma camera according to claim 2 or 3 combining a support member holding an angle setting mechanism of the above-mentioned detector, and some tables which **** analyte by a coupling member, and defining a relative position of the above-mentioned detector and a table.

TECHNICAL FIELD

[Field of the Invention] This invention about the gamma camera which detects and carries out signal processing of the radiation emitted from an object organ in nuclear medicine image diagnosis by the radioactive medicine prescribed for the patient into analyte, and generates a radiological image, It is related with the gamma camera which can improve the image quality of the radiological image acquired by avoiding incidence of the radiation from the background parts of the object organ of analyte, and lessening incorporation of noise especially.

PRIOR ART

[Description of the Prior Art]The detector 1 which enters and detects radiation as this conventional kind of gamma camera is shown in drawing 5 and drawing 6, The arm as the support member 2 holding this detector 1, and the moving mechanism 3 which rotates the above-mentioned detector 1 around movement and the table 5 along with the longitudinal direction of the table 5, It has the detector stand 4 which supports these, and the radiation distribution image of the inside of the body of the analyte 6 ****(ed) on the table 5 is photoed. And the number of the above-mentioned detectors 1 was made into 1-4 sets, and when the detector 1 is plurality, as shown in drawing 6, it is usually arranged so that it may turn to mutually the radiation incidence side 7 in which the collimator was formed inside towards the body axis of the analyte 6 (graphic display abbreviation) ****(ed) on the table 5.

[0003]Drawing 7 is the above-mentioned conventional gamma camera, and is an explanatory view showing the arrangement relationship of the analyte 6 when carrying out picture photography by making especially the udder of the analyte 6 into the object organ 8, and the detector 1. In this case, he slept on the table 5 at proneness, and the udder as the object organ 8 was put into the hole which ended on this table 5, and the analyte 6 located the two detectors 1 and 1 down the table 5, it approached the two object organs 8 and 8, respectively, and arranged it. Since the above-mentioned detectors 1 and 1 had been arranged at this time so that it may be mutually suitable inside towards the body axis of the analyte 6, they were arranged to approximately V type so that the analyte 6 might be expected for the radiation incidence sides 7 and 7 of the two detectors 1 and 1 inside in the lower part of the table 5. As for this, the detector 1 of the conventional gamma camera is constituted using two or more photo-multipliers, It is because only such arrangement can be taken to approach the two object organs 8 and 8 as much as possible, and arrange the two detectors 1 and 1 to them since the height of the direction which intersects perpendicularly with the radiation incidence side 7 is large and the whole has large-sized-ized.

EFFECT OF THE INVENTION

[Effect of the Invention]Since it comprised this invention as mentioned above, thickness connects the side edge part which turns a radiation incidence side to a uniform direction, and adjoins mutually two or more detectors formed small, and. Setting out of a mutual radiation incidence face-to-face angle to a free angle which avoids incidence of the radiation from the background parts of the object organ of analyte was enabled.

Therefore, the image quality of the radiological image acquired by avoiding incidence of the radiation from the background parts of the object organ of analyte, and lessening incorporation of noise can be improved.

Since the thickness of a detector is formed small and miniaturized, only an object organ can be approached enough, the above-mentioned detector can be arranged, and the good picture of this object organ can be acquired.

[0026]Connect the side edge part where two detectors adjoin mutually by a connecting member, and. By an angle setting mechanism, connect both detectors so that setting out to a free angle is possible, and the above-mentioned angle setting mechanism is held by a support member, In what arranged the radiation incidence side of two above-mentioned detectors to abbreviated reverse V type, to the inside between two object organs, the radiation incidence side of two detectors can be turned outside, and can be arranged.

[0027]Connect the side edge part where two detectors adjoin mutually by a connecting member,

of the t r a or n b net ear t eye d co m * h s a i ant eby he c ti a m m y 2 e
h t H n v A e i n f h ec n e s n e r a n * n e e u g n e c a e m
T E b h e o b o n o d e t d a l c t b a d l m r s
C i L r O E v o w e t t e
i a s t y L e M t b onr e t I w e t t e
h c e s a n M t b onr e t I w e t t e
a r N t e t 8 S u t d y t o i n y m t e r s u a l v i c
m f e h e a a g i n l c u r n h r t a p o m a i g o d e o v l a n l t e a h l b
c a v l o f v h r a i o n l p n a r a b s e n F a n y o o a i y o d p c t a a d a n e t e n f h t
t e p a i t r e o v n o n l n e c e g d s h o y 7 x f h a h w o o t a a n e t e n f h t
p r v d e t b t h u n c i e t c e d e p n l t w h t o d a y l c 8 s a n l t e a d s o
t x c r a n e g i b d o p n a c n u a r d t o s c d e t h e m e d 8 h a f e s t x b f 1 s r i
h a m p a m a m n g l q n l e c o s c d e t h e m e d 8 h a f e s t x b f 1 s r i
t a h i o d h c d p f b g k u n o g a t o f b b j o u c f a n o a h n r d h r a o a o m n
e u p o h e h g r d y t a b g t o g a t o t d e k t e n r e m e t r h u n c e s o
s h b a p o a j e t b n 8 n d h e d n a e t n g r a n o s n t h e q m i g s q a l s a y o
i h e n e r e h e h e a b u g h d r a e o n m e e t o b l n d h o y h o g h s q a l s a y o
n o l c u p t o r a f e e e t o v s a t d a r o t o t s O y l a h y n t e a a n d d c f t
m 0 5 c u p t o r a f e e e t o v s a t d a r o t o t s O y l a h y n t e a a n d d c f t
n 0 n e e t n e o f h e a v e a n m s n p w b y h e n m l a u r p b h c n i p o e a n d
n o a d e o a a o f e l d r i l o s c e p o n c o r e d i c o p h o h s c a n w e m v o r g e t e
c i e c a n o o i a n o m l m g e i r a n d p t t e w i t c e o o c a y a a d e s h i n
p r t o f r o n g m l m g e i r a n d p t t e w i t c e o o c a y a a d e s h i n
F S

E A L R T
D T e D D C P I
[0 t h a l e v s c p o n i t h e n
[1 t h a l e v s c p o n i t h e n
s 0 t h a l e v s c p o n i t h e n
i o d t e l n i n l h s n v n b t h g m a m w c e t e t s n a r s u t
r g n o f b s i e e a h e r a i n n i t o u n a b e c a e h n l h r e d a d a r s u t
a a s o s y s h g d i a t i o e n e e e o u m a b j e p l g e a l h a e a m c m a e o
f n l o s c a l m m l o s a e d i c m t e r b e a d o r e p l a n t n h l a y t a i c m e n e a
h d r a i l i l g a t e r e t e w t h e s c m c f o r a w i c a o r o m t h e m a g r s a
f e h d o o s t a n g a u r d b y v o d i n m i c m e o f h h n o p l o v t h e b e q a i v t
b o t o j e c t o r a f n y t a n l e s s e n n c o c a o o f n o i e s p e a l y c g r o n d p a r t s
[0 2 p e u f a s a f e P i o A l t e r h h e t e r a e s i n s h i
D e c i n n o i n d o g a m r t h e d e c t o l w i c n s n d d e t c t r a d i a t i o n a t i s
c o n e n t o a l k f e m a e a m e r a i s s h o w n i n d r a w i n g 5 a n d d r a w i n g 6 T h e a r m a s t h e

support member 2 holding this detector 1, and the moving mechanism 3 which rotates the above-mentioned detector 1 around movement and the table 5 along with the longitudinal direction of the table 5, It has the detector stand 4 which supports these, and the radiation distribution image of the inside of the body of the analyte 6 ****(ed) on the table 5 is photoed. And the number of the above-mentioned detectors 1 was made into 1-4 sets, and when the detector 1 is plurality, as shown in drawing 6, it is usually arranged so that it may turn to mutually the radiation incidence side 7 in which the collimator was formed inside towards the body axis of the analyte 6 (graphic display abbreviation) ****(ed) on the table 5.

[0003]Drawing 7 is the above-mentioned conventional gamma camera, and is an explanatory view showing the arrangement relationship of the analyte 6 when carrying out picture photography by making especially the udder of the analyte 6 into the object organ 8, and the detector 1. In this case, he slept on the table 5 at proneness, and the udder as the object organ 8 was put into the hole which ended on this table 5, and the analyte 6 located the two detectors 1 and 1 down the table 5, it approached the two object organs 8 and 8, respectively, and arranged it. Since the above-mentioned detectors 1 and 1 had been arranged at this time so that it may be mutually suitable inside towards the body axis of the analyte 6, they were arranged to approximately V type so that the analyte 6 might be expected for the radiation incidence sides 7 and 7 of the two detectors 1 and 1 inside in the lower part of the table 5. As for this, the detector 1 of the conventional gamma camera is constituted using two or more photo-multipliers, It is because only such arrangement can be taken to approach the two object organs 8 and 8 as much as possible, and arrange the two detectors 1 and 1 to them since the height of the direction which intersects perpendicularly with the radiation incidence side 7 is large and the whole has large-sized-ized.

[0004]

[Problem(s) to be Solved by the Invention]However, in such conventional gamma camera, When carrying out picture photography by making especially the udder of the analyte 6 into the object organ 8, Since it arranged to approximately V type so that the analyte 6 might be expected for the radiation incidence sides 7 and 7 of the two detectors 1 and 1 inside as shown in drawing 7, the above-mentioned detectors 1 and 1, While detecting the radiation emitted from the radioactive medicine accumulated on the object organs 8 and 8, the radiation existed for example, emitted to the background parts of these object organs 8 and 8 from other organs 9, such as the heart and a lung, might be detected. At this time, the radiation from the above-mentioned object organ 8 and the organ 9 of background parts other than eight is unnecessary to this picture photography, and is incorporated into it as noise. Therefore, the image quality of the taken image of the object organs 8 and 8 might deteriorate. Only the object organs 8 and 8 could not be approached enough, the above-mentioned detectors 1 and 1 have not been arranged, and the good picture of these object organs 8 and 8 was not able to be acquired.

[0005]Then, an object of this invention is to provide the gamma camera which can improve the image quality of the radiological image acquired by coping with such a problem, avoiding incidence of the radiation from the background parts of the object organ of analyte, and lessening incorporation of noise.

[0006]

[Means for Solving the Problem]To achieve the above objects, gamma camera by this invention, In gamma camera which generates a radiological image from position information on radiation which it has a detector which enters and detects radiation emitted from an object organ by a radioactive medicine prescribed for the patient into analyte, processed a detecting signal from

this detector, and entered [above-mentioned], A side edge part where thickness turns a radiation incidence side to a uniform direction, and adjoins mutually two or more detectors formed small is connected, and setting out of a mutual radiation incidence face-to-face angle to a free angle which avoids incidence of radiation from background parts of an object organ of analyte is enabled.

[0007]A side edge part where two detectors adjoin mutually is connected by a connecting member, and by an angle setting mechanism, both detectors are connected so that setting out to a free angle is possible, and the above-mentioned angle setting mechanism is held by a support member, and it may be made to arrange a radiation incidence side of two above-mentioned detectors to abbreviated reverse V type.

[0008]Connect a side edge part where two detectors adjoin mutually by a connecting member, and. It has 2 sets of detector groups which connected both detectors by an angle setting mechanism so that setting out to a free angle was possible, those angle setting mechanisms are held by a support member, and it may be made to arrange a radiation incidence side of the 2 above-mentioned sets of detector groups to approximately W type.

[0009]A support member holding an angle setting mechanism of the above-mentioned detector and some tables which **** analyte are combined by a coupling member further again, and it may be made to define a relative position of the above-mentioned detector and a table.

[0010]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described based on an accompanying drawing. Drawing 1 is a front view showing the detector in a first embodiment of the gamma camera by this invention. This gamma camera is what detects and carries out signal processing of the radiation emitted from an object organ in nuclear medicine image diagnosis by the radioactive medicine prescribed for the patient into analyte, and generates a radiological image, An udder is mainly made into an object organ, and the overall device outline is similarly constituted, if shown in drawing 5 and drawing 6.

[0011]The gamma camera of this invention has two or more detectors 10a and 10b with which thickness was small formed and the whole was miniaturized, as shown in drawing 1. These detectors 10a and 10b are semiconductor detectors miniaturized by semiconductor-ized art in recent years not using the conventional photo-multiplier, the height (thickness) of the direction which intersects perpendicularly with the radiation incidence sides 11a and 11b in which the collimator was formed is made small, and the whole is miniaturized.

[0012]And the two above-mentioned detectors 10a and 10b are connected by the connecting member 12 made rotatable [the side edge part which turns the radiation incidence sides 11a and 11b to a uniform direction, and adjoins mutually] in the shape of a hinge, as shown in drawing 1 (a). Thereby, as shown in drawing 1 (b), the mutual radiation incidence side 11a and the angle theta between 11b are rotated like the arrows P and Q so that incidence of the radiation from the background parts of the object organ of analyte can be avoided, and setting out to the free angle from a proper acute angle to the angle of 180 degrees or more is enabled. The two detectors 10a and 10b connected by the above-mentioned connecting member 12 in this state are connected to the support member 2 shown in above-mentioned drawing 5 by a proper member.

[0013]If the radiation incidence side 11a of the two detectors 10a and 10b and the angle theta between 11b are set as the free angle of 180 degrees or more in this embodiment as shown in drawing 1 (b), To the inside between the udders as the two object organs 8 and 8 shown in above-mentioned drawing 7, the radiation incidence sides 11a and 11b can be turned outside, and can be arranged, and incidence of the radiation from other organs 9 of the background parts of

these object organs 8 and 8 can be avoided.

[0014]Drawing 2 is a transverse-plane explanatory view showing a second embodiment of this invention. This embodiment connects the side edge part where the two detectors 10a and 10b adjoin mutually by the connecting member 12, and. By the angle setting mechanism 13, both the detectors 10a and 10b are connected so that setting out to a free angle is possible, and the above-mentioned angle setting mechanism 13 is held by the support member 2, and the radiation incidence sides 11a and 11b of the two above-mentioned detectors 10a and 10b are arranged to abbreviated reverse V type.

[0015]Namely, in drawing 2 the above-mentioned angle setting mechanism 13, The first link 14a and 14b connected with the end of the connecting member 12 in the one side face of each detectors 10a and 10b, The second link 15a and 15b that the end part was connected with the pars intermedia of this first link 14a and 14b, and was connected with the nut 17 of the after-mentioned [the other end], It comprises the screw 16 by which the end part was connected to the pars intermedia of the above-mentioned connecting member 12, the nut 17 screwed in this screw 16, the electric motor 18 which drives the above-mentioned screw 16, and the stationary plate 19 which an end part is connected to the above-mentioned connecting member 12, and fixes the above-mentioned electric motor 18. And the above-mentioned stationary plate 19 is connected to the support member 2.

[0016]Next, operation of the angle setting mechanism 13 constituted as mentioned above is explained with reference to drawing 3. Especially drawing 3 is an explanatory view showing the arrangement relationship of the analyte 6 when carrying out picture photography by making the udder of the analyte 6 into the object organ 8, and the detectors 10a and 10b. In this case, the analyte 6 goes to sleep on the table 5 at proneness, puts the udder as the object organ 8 into the hole which ended on this table 5, and is a thing of the table 5 which locates the two detectors 10a and 10b caudad, approaches the two object organs 8 and 8, respectively, and is arranged.

[0017]First, in the above-mentioned angle setting mechanism 13, it is assumed in the length of the first link 14a and 14b, the second link 15a and 15b, and the screw 16 that the conditions of $AB=AC$ and $BE=CD$ are fulfilled. In this state, the electric motor 18 is driven, the screw 16 is rotated in the necessary direction, and the nut 17 is moved in the direction which separates from the connecting member 12 on this screw 16. Then, the end part of the second link 15a and 15b moves to the direction of the electric motor 18 from the connecting member 12 side with the nut 17, and this rotates the first link 14a and 14b focusing on the axes E and D of the both ends of the connecting member 12. Each detectors 10a and 10b can also be rotated with rotation of this first link 14a and 14b, and the angle theta which each radiation incidence side 11a and 11b makes can be adjusted like drawing 1 (b).

[0018]In this case, the electric motor 18 is driven till the place whose angle theta which the above-mentioned radiation incidence sides 11a and 11b make at the angle which the side inside the udder as the two object organs 8 and 8 makes suits, the screw 16 is rotated, and it is made to stop in the place where the above-mentioned angle theta agreed. Thereby, to the inside between the udders as the two object organs 8 and 8, the radiation incidence sides 11a and 11b can be turned outside, and can be arranged, and the radiation incidence sides 11a and 11b of the two above-mentioned detectors 10a and 10b can be arranged to abbreviated reverse V type. At this time, incidence of the radiation from other organs 9 of the background parts of the above-mentioned object organs 8 and 8 is avoidable.

[0019]The support member 2 holding the angle setting mechanism 13 of the above-mentioned detectors 10a and 10b and some tables 5 which **** analyte 6 are combined by the coupling

member 20, and it may be made to define the relative position of the above-mentioned detectors 10a and 10b and the table 5 in drawing 3.

[0020]Drawing 4 is a transverse-plane explanatory view showing a third embodiment of this invention. If this embodiment is shown in drawing 2, will connect similarly the side edge part where two detectors adjoin mutually by the connecting member 12, and. It has 2 sets of detector groups 10a which connected both detectors by the angle setting mechanism 13 so that setting out to a free angle was possible, 10b;10c, and 10 d, Those angle setting mechanisms 13a and 13b are held by the support member 2, and the 2 above-mentioned sets of detector groups 10a, 10b;10c, the 10-d radiation incidence side 11a, 11b;11c, and 11 d are arranged to approximately W type.

[0021]If the above-mentioned angle setting mechanisms 13a and 13b are shown in drawing 2, they are completely constituted in a similar manner, and they operate similarly with drawing 3 having explained. The operation in this third embodiment is a thing of the table 5 which locates 2 sets of detector groups 10a, 10b;10c, and 10 d caudad, approaches the two object organs 8 and 8, respectively, and is arranged, this -- by the two detectors 10a and 10b and 10c and 10d, from both outsides, as the two object organs 8 and 8 are inserted, they are arranged, respectively.

Therefore, the electric motor 18 is driven, the screw 16 is rotated in the necessary direction, and the nut 17 is moved in the direction which approaches the connecting member 12 on this screw 16. Then, the end part of the second link 15a and 15b moves to the direction of the connecting member 12 from the electric motor 18 side with the nut 17, Thereby, it rotates to the arrows P and Q and opposite hand which are shown in drawing 1 (b) focusing on the axes E and D of the both ends of the connecting member 12, and each detector 10a, 10b;10c, and no less than 10 d of the first link 14a and 14b is rotated in the direction with rotation of this first link 14a and 14b.

[0022]In this case, the electric motor 18 is driven till the place the above-mentioned radiation incidence side 11a, 11b;11c, and whose angle theta of 11 d to make suit to the angle which the both-outsides side of the udder as the two object organs 8 and 8 makes, the screw 16 is rotated, and it is made to stop in the place where the above-mentioned angle theta agreed. By this, so that the udder as the two object organs 8 and 8 may be inserted from both outsides, respectively, The radiation incidence side 11a, 11b;11c, and 11 d can be turned inside, and can be arranged, and the 2 above-mentioned sets of detector groups 10a, 10b;10c, the radiation incidence side 11a that is 10d, 11b;11c, and 11 d can be arranged to approximately W type. At this time, incidence of the radiation from other organs 9 of the background parts of the above-mentioned object organs 8 and 8 is avoidable.

[0023]The photography from the both sides side of the above-mentioned object organs 8 and 8 and the photography from the both side surfaces of the direction which intersects perpendicularly with this can be switched by establishing the rolling mechanism which rotates this stationary plate 19 to the circumference of the major axis between the stationary plate 19 of the above-mentioned angle setting mechanisms 13a and 13b, and the support member 2.

[0024]The support member 2 which holds the 2 above-mentioned sets of detector groups 10a, 10b;10c, and the 10-d angle setting mechanisms 13a and 13b also in drawing 4, Some tables 5 which **** analyte 6 are combined by the coupling member 20, and it may be made to define the relative position of the above-mentioned detector group 10a, 10b;10c, 10 d, and the table 5.

[0025]

[Effect of the Invention]Since this invention was constituted as mentioned above, thickness connects the side edge part which turns a radiation incidence side to a uniform direction, and adjoins mutually two or more detectors formed small, and. By having enabled setting out of a mutual radiation incidence face-to-face angle to a free angle which avoids incidence of the

and some tables which **** analyte are combined by a coupling member further again, and it may be made to define a relative position of the above-mentioned detector and a table.

[0010]

[Embodiment of the Invention] Hereafter, an embodiment of the invention is described based on an accompanying drawing. Drawing 1 is a front view showing the detector in a first embodiment of the gamma camera by this invention. This gamma camera is what detects and carries out signal processing of the radiation emitted from an object organ in nuclear medicine image diagnosis by the radioactive medicine prescribed for the patient into analyte, and generates a radiological image. An udder is mainly made into an object organ, and the overall device outline is similarly constituted, if shown in drawing 5 and drawing 6.

[0011] The gamma camera of this invention has two or more detectors 10a and 10b with which thickness was small formed and the whole was miniaturized, as shown in drawing 1. These detectors 10a and 10b are semiconductor detectors miniaturized by semiconductor-ized art in recent years not using the conventional photo-multiplier, the height (thickness) of the direction which intersects perpendicularly with the radiation incidence sides 11a and 11b in which the collimator was formed is made small, and the whole is miniaturized.

[0012] And the two above-mentioned detectors 10a and 10b are connected by the connecting member 12 made rotatable [the side edge part which turns the radiation incidence sides 11a and 11b to a uniform direction, and adjoins mutually] in the shape of a hinge, as shown in drawing 1 (a). Thereby, as shown in drawing 1 (b), the mutual radiation incidence side 11a and the angle theta between 11b are rotated like the arrows P and Q so that incidence of the radiation from the background parts of the object organ of analyte can be avoided, and setting out to the free angle from a proper acute angle to the angle of 180 degrees or more is enabled. The two detectors 10a and 10b connected by the above-mentioned connecting member 12 in this state are connected to the support member 2 shown in above-mentioned drawing 5 by a proper member.

[0013] If the radiation incidence side 11a of the two detectors 10a and 10b and the angle theta between 11b are set as the free angle of 180 degrees or more in this embodiment as shown in drawing 1 (b), To the inside between the udders as the two object organs 8 and 8 shown in above-mentioned drawing 7, the radiation incidence sides 11a and 11b can be turned outside, and can be arranged, and incidence of the radiation from other organs 9 of the background parts of these object organs 8 and 8 can be avoided.

[0014] Drawing 2 is a transverse-plane explanatory view showing a second embodiment of this invention. This embodiment connects the side edge part where the two detectors 10a and 10b adjoin mutually by the connecting member 12, and. By the angle setting mechanism 13, both the detectors 10a and 10b are connected so that setting out to a free angle is possible, and the above-mentioned angle setting mechanism 13 is held by the support member 2, and the radiation incidence sides 11a and 11b of the two above-mentioned detectors 10a and 10b are arranged to abbreviated reverse V type.

[0015] Namely, in drawing 2 the above-mentioned angle setting mechanism 13, The first link 14a and 14b connected with the end of the connecting member 12 in the one side face of each detectors 10a and 10b, The second link 15a and 15b that the end part was connected with the pars intermedia of this first link 14a and 14b, and was connected with the nut 17 of the after-mentioned [the other end], It comprises the screw 16 by which the end part was connected to the pars intermedia of the above-mentioned connecting member 12, the nut 17 screwed in this screw 16, the electric motor 18 which drives the above-mentioned screw 16, and the stationary plate 19 which an end part is connected to the above-mentioned connecting member 12, and

fixes the above-mentioned electric motor 18. And the above-mentioned stationary plate 19 is connected to the support member 2.

[0016]Next, operation of the angle setting mechanism 13 constituted as mentioned above is explained with reference to drawing 3. Especially drawing 3 is an explanatory view showing the arrangement relationship of the analyte 6 when carrying out picture photography by making the udder of the analyte 6 into the object organ 8, and the detectors 10a and 10b. In this case, the analyte 6 goes to sleep on the table 5 at proneness, puts the udder as the object organ 8 into the hole which ended on this table 5, and is a thing of the table 5 which locates the two detectors 10a and 10b caudad, approaches the two object organs 8 and 8, respectively, and is arranged.

[0017]First, in the above-mentioned angle setting mechanism 13, it is assumed in the length of the first link 14a and 14b, the second link 15a and 15b, and the screw 16 that the conditions of $AB=AC$ and $BE=CD$ are fulfilled. In this state, the electric motor 18 is driven, the screw 16 is rotated in the necessary direction, and the nut 17 is moved in the direction which separates from the connecting member 12 on this screw 16. Then, the end part of the second link 15a and 15b moves to the direction of the electric motor 18 from the connecting member 12 side with the nut 17, and this rotates the first link 14a and 14b focusing on the axes E and D of the both ends of the connecting member 12. Each detectors 10a and 10b can also be rotated with rotation of this first link 14a and 14b, and the angle theta which each radiation incidence side 11a and 11b makes can be adjusted like drawing 1 (b).

[0018]In this case, the electric motor 18 is driven till the place whose angle theta which the above-mentioned radiation incidence sides 11a and 11b make at the angle which the side inside the udder as the two object organs 8 and 8 makes suits, the screw 16 is rotated, and it is made to stop in the place where the above-mentioned angle theta agreed. Thereby, to the inside between the udders as the two object organs 8 and 8, the radiation incidence sides 11a and 11b can be turned outside, and can be arranged, and the radiation incidence sides 11a and 11b of the two above-mentioned detectors 10a and 10b can be arranged to abbreviated reverse V type. At this time, incidence of the radiation from other organs 9 of the background parts of the above-mentioned object organs 8 and 8 is avoidable.

[0019]The support member 2 holding the angle setting mechanism 13 of the above-mentioned detectors 10a and 10b and some tables 5 which **** analyte 6 are combined by the coupling member 20, and it may be made to define the relative position of the above-mentioned detectors 10a and 10b and the table 5 in drawing 3.

[0020]Drawing 4 is a transverse-plane explanatory view showing a third embodiment of this invention. If this embodiment is shown in drawing 2, will connect similarly the side edge part where two detectors adjoin mutually by the connecting member 12, and. It has 2 sets of detector groups 10a which connected both detectors by the angle setting mechanism 13 so that setting out to a free angle was possible, 10b;10c, and 10 d, Those angle setting mechanisms 13a and 13b are held by the support member 2, and the 2 above-mentioned sets of detector groups 10a, 10b;10c, the 10-d radiation incidence side 11a, 11b;11c, and 11 d are arranged to approximately W type.

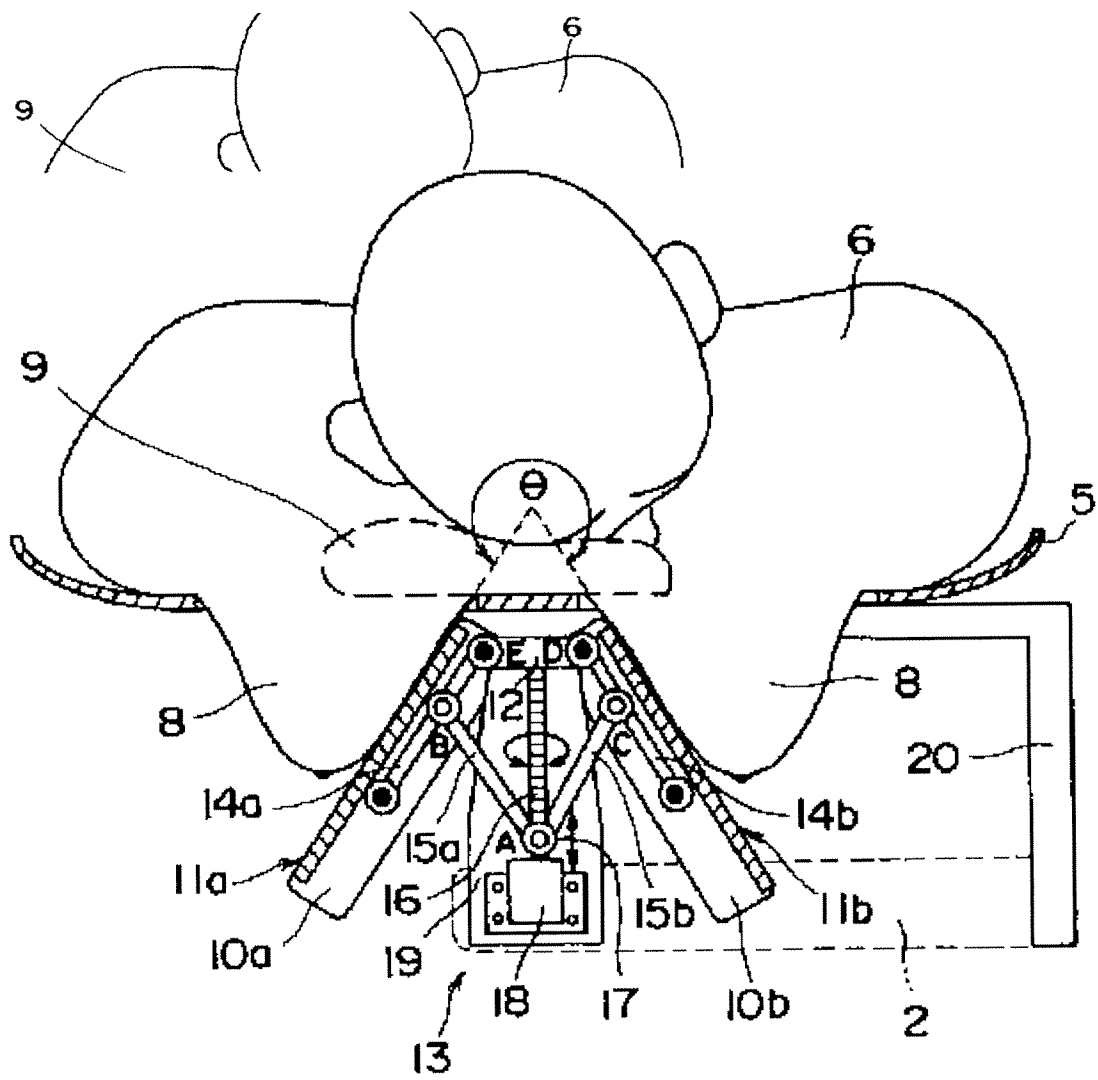
[0021]If the above-mentioned angle setting mechanisms 13a and 13b are shown in drawing 2, they are completely constituted in a similar manner, and they operate similarly with drawing 3 having explained. The operation in this third embodiment is a thing of the table 5 which locates 2 sets of detector groups 10a, 10b;10c, and 10 d caudad, approaches the two object organs 8 and 8, respectively, and is arranged, this -- by the two detectors 10a and 10b and 10c and 10d, from both outsides, as the two object organs 8 and 8 are inserted, they are arranged, respectively. Therefore, the electric motor 18 is driven, the screw 16 is rotated in the necessary direction, and

the nut 17 is moved in the direction which approaches the connecting member 12 on this screw 16. Then, the end part of the second link 15a and 15b moves to the direction of the connecting member 12 from the electric motor 18 side with the nut 17, Thereby, it rotates to the arrows P and Q and opposite hand which are shown in drawing 1 (b) focusing on the axes E and D of the both ends of the connecting member 12, and each detector 10a, 10b;10c, and no less than 10 d of the first link 14a and 14b is rotated in the direction with rotation of this first link 14a and 14b.

[0022]In this case, the electric motor 18 is driven till the place the above-mentioned radiation incidence side 11a, 11b;11c, and whose angle theta of 11 d to make suit to the angle which the both-outside side of the udder as the two object organs 8 and 8 makes, the screw 16 is rotated, and it is made to stop in the place where the above-mentioned angle theta agreed. By this, so that the udder as the two object organs 8 and 8 may be inserted from both outsides, respectively, The radiation incidence side 11a, 11b;11c, and 11 d can be turned inside, and can be arranged, and the 2 above-mentioned sets of detector groups 10a, 10b;10c, the radiation incidence side 11a that is 10d, 11b;11c, and 11 d can be arranged to approximately W type. At this time, incidence of the radiation from other organs 9 of the background parts of the above-mentioned object organs 8 and 8 is avoidable.

[0023]The photography from the both sides side of the above-mentioned object organs 8 and 8 and the photography from the both side surfaces of the direction which intersects perpendicularly with this can be switched by establishing the rolling mechanism which rotates this stationary plate 19 to the circumference of the major axis between the stationary plate 19 of the above-mentioned angle setting mechanisms 13a and 13b, and the support member 2.

[0024]The support member 2 which holds the 2 above-mentioned sets of detector groups 10a, 10b;10c, and the 10-d angle setting mechanisms 13a and 13b also in drawing 4, Some tables 5 which **** analyte 6 are combined by the coupling member 20, and it may be made to define the relative position of the above-mentioned detector group 10a, 10b;10c, 10 d, and the table 5.



Drawing 3

